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UTILITY PATENT APPLICATION TRANSMITTAL (Large Entity)

(Only for new nonprovisional applications under 37 CFR 1.53(b))

Docket No.
FJC-102US

Total Pages in this Submission

TO THE ASSISTANT COMMISSIONER FOR PATENTSBox Patent Application
Washington, D.C. 20231

Transmitted herewith for filing under 35 U.S.C. 111(a) and 37 C.F.R. 1.53(b) is a new utility patent application for an invention entitled:

A NOVEL COOKED SAUSAGE AND A METHOD FOR MAKING THE SAME

and invented by:

Bernard Trevor MATTHEWS; David John JOLL; Werner KOPPERS; Friedrich BUSE

jc564 U.S. PTO
09/557418
04/21/00If a **CONTINUATION APPLICATION**, check appropriate box and supply the requisite information:
☐ Continuation ☐ Divisional ☒ Continuation-in-part (CIP) of prior application No.: PCT/GB98/02999

Which is a:

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Enclosed are:

Application Elements

1. ☒ Filing fee as calculated and transmitted as described below
2. ☒ Specification having 36 pages and including the following:
 - a. ☒ Descriptive Title of the Invention
 - b. ☐ Cross References to Related Applications (if applicable)
 - c. ☐ Statement Regarding Federally-sponsored Research/Development (if applicable)
 - d. ☐ Reference to Microfiche Appendix (if applicable)
 - e. ☒ Background of the Invention
 - f. ☒ Brief Summary of the Invention
 - g. ☒ Brief Description of the Drawings (if drawings filed)
 - h. ☒ Detailed Description
 - i. ☒ Claim(s) as Classified Below
 - j. ☒ Abstract of the Disclosure

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Application Elements (Continued)

3. ☒ Drawing(s) *(when necessary as prescribed by 35 USC 113)*
- a. ☒ Formal Number of Sheets 2
- b. ☐ Informal Number of Sheets _____
4. ☒ Oath or Declaration
- a. ☐ Newly executed *(original or copy)* ☒ Unexecuted
- b. ☐ Copy from a prior application (37 CFR 1.63(d)) *(for continuation/divisional application only)*
- c. ☒ With Power of Attorney ☐ Without Power of Attorney
- d. ☐ DELETION OF INVENTOR(S)
Signed statement attached deleting inventor(s) named in the prior application,
see 37 C.F.R. 1.63(d)(2) and 1.33(b).
5. ☐ Incorporation By Reference *(usable if Box 4b is checked)*
The entire disclosure of the prior application, from which a copy of the oath or declaration is supplied under
Box 4b, is considered as being part of the disclosure of the accompanying application and is hereby
incorporated by reference therein.
6. ☐ Computer Program in Microfiche *(Appendix)*
7. ☐ Nucleotide and/or Amino Acid Sequence Submission *(if applicable, all must be included)*
- a. ☐ Paper Copy
- b. ☐ Computer Readable Copy *(identical to computer copy)*
- c. ☐ Statement Verifying Identical Paper and Computer Readable Copy

Accompanying Application Parts

8. ☐ Assignment Papers *(cover sheet & document(s))*
9. ☐ 37 CFR 3.73(B) Statement *(when there is an assignee)*
10. ☐ English Translation Document *(if applicable)*
11. ☐ Information Disclosure Statement/PTO-1449 ☐ Copies of IDS Citations
12. ☒ Preliminary Amendment
13. ☒ Acknowledgment postcard
14. ☒ Certificate of Mailing
- ☐ First Class ☒ Express Mail *(Specify Label No.):* EJ914200580US

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Accompanying Application Parts (Continued)

15. ☐ Certified Copy of Priority Document(s) *(if foreign priority is claimed)*

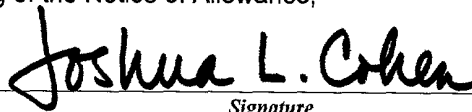
16. ☐ Additional Enclosures *(please identify below):*

Fee Calculation and Transmittal

CLAIMS AS FILED

For	#Filed	#Allowed	#Extra		Rate	Fee
Total Claims	43	- 20 =	23	x	\$18.00	\$414.00
Indep. Claims	4	- 3 =	1	x	\$78.00	\$78.00
Multiple Dependent Claims (check if applicable) <input type="checkbox"/>						\$0.00
BASIC FEE						\$690.00
OTHER FEE (specify purpose) _____						\$0.00
TOTAL FILING FEE						\$1,182.00

- ☒ A check in the amount of **\$1,182.00** to cover the filing fee is enclosed.
- ☒ The Commissioner is hereby authorized to charge and credit Deposit Account No. **18-0350** as described below. A duplicate copy of this sheet is enclosed.
- ☐ Charge the amount of _____ as filing fee.
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- ☒ Charge any additional filing fees required under 37 C.F.R. 1.16 and 1.17.
- ☐ Charge the issue fee set in 37 C.F.R. 1.18 at the mailing of the Notice of Allowance, pursuant to 37 C.F.R. 1.311(b).


Signature

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Dated: April 21, 2000

CC:

EXPRESS MAIL

CERTIFICATE OF MAILING - SEPARATE PAPER

In the Application of: Bernard Trevor Matthews et al.

Serial Number: To Be Assigned

Filed: Herewith

I hereby certify that a **CONTINUATION-IN-PART APPLICATION TRANSMITTAL (with its enclosures as listed below)** are being deposited with the United States Postal Service "EXPRESS MAIL POST OFFICE TO ADDRESSEE" service under 37 CFR 1.10 on the date indicated below with sufficient postage and is addressed to the Assistant Commissioner for Patents, Washington, DC 20231, Box Patent Application on:

Date: April 21, 2000


Kathleen Libby

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Continuation-in-Part Application Transmittal (3 pages in duplicate)
Specification and Claims (36 pages)
Preliminary Amendment (1 page)
Unexecuted DEC/POA (3 pages)
(2) Sheets of Formal Drawings
(1) check

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Bernard Trevor Matthews et al.	: Art Unit:
Serial No.:	To Be Assigned	: Examiner:
Filed:	Herewith	:
FOR:	A NOVEL COOKED SAUSAGE AND A	:
	METHOD FOR MAKING THE SAME	

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

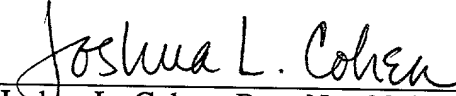
S I R :

Prior to examination, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Insert, before the first line, the sentence: -- This application is a continuation-in-part application of PCT/GB98/02999 filed on October 7, 1998. --

Respectfully Submitted,


Joshua L. Cohen, Reg. No. 38,040
Attorney for Applicants

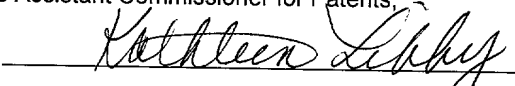
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Kathleen Libby

**A NOVEL COOKED SAUSAGE AND A METHOD FOR
MAKING THE SAME**

5 FIELD OF THE INVENTION

The present invention relates to a novel cooked
sausage and to a method for making the same. In
particular, the invention relates to a cooked sausage
comprising meat and a fermented milk product.

10

BACKGROUND TO THE INVENTION

At the time of writing, there is a general consumer
demand for meat and sausage products that are easier
to digest and contain fewer calories than traditional
15 meat sausages. Previous attempts have been made to
meet this demand by providing reduced fat sausages
which are widely perceived by consumers to be
healthier than the traditional variety. To this end,
sausages have been produced using meat that is as lean
20 as possible. Poultry meat, for example, has been used
increasingly in the production of sausages and other
consumer meat products.

EP-A-0029503 (Stauffer Chemical Company Limited)
25 discloses an improved fermented sausage which

comprises meat and a cultured dairy product. The cultured dairy product, which is preferably derived from whey and used dry, is cultured using traditional yogurt starter cultures comprising L. Bulgaricus and

5 S. Thermophilus until a final pH in the range of 4.2 to 4.3 is reached. On admixing the dairy product to a meat emulsion, a final product pH in the range of 4.5 to 4.8 is achieved, without requiring any further fermentation of the meat product. After stuffing, the

10 sausage is ripened, dried and/or smoked as required.

EP-A-0478526 (Vleeswarenfabrieken Imperial Naamloze Vennootschap) discloses a meat product, for example a sausage, comprising meat and a dairy product,

15 preferably curdled bactofugated milk, eg melted cheese or curd. EP-A-0478526 discloses that the dairy product is prepared by curdling the bactofugated milk using traditional cheese coagulating agents, such as rennet ferment or other proteolytic enzymes from

20 vegetable or microbial origin. The dairy product, on addition to the meat, has a pH in the range of 5.0 to 5.6. The mixture is then fermented further until a final pH of 4.6 to 5.2 is reached.

OBJECTS OF THE INVENTION

An object of the present invention is to provide a novel meat product. In particular, it is an object of the present invention to provide a novel cooked
5 sausage.

Another object of the present invention is to provide a cooked sausage that will be perceived by consumers to be healthy to eat, and which comprises fewer
10 calories than traditional meat sausages.

Yet another object of the present invention is to provide an improved cooked sausage comprising meat and a fermented dairy product.
15

SUMMARY OF THE INVENTION

According to one aspect of the present invention there is provided a cooked sausage comprising a mixture of a meat emulsion and a fermented milk product having a pH
20 of at least about 4.6, wherein said fermented milk product is substantially homogeneously dispersed throughout the meat emulsion and said mixture has a pH of about 5.5 or more.

25

In a different aspect of the present invention, there is provided a method of making a cooked sausage which comprises forming a mixture of a meat emulsion and a fermented milk product having a pH of at least about 4.6, in which mixture said fermented milk product is substantially homogeneously dispersed through the emulsion, forming the mixture into a sausage, and thereafter cooking the sausage; wherein the pH and proportion of the fermented milk product in the mixture is such that the pH of the mixture is 5.5 or more.

Said fermented milk product may comprise one or more products selected from mild yogurt, buttermilk, soured cream milk, soured milk, fresh cheese, fermented whey and kefir.

The term "soured cream milk" as used herein includes soured cream, sauerrahm, schmand and creme fraiche.

The term "soured milk" includes sauermilch and dickmilch.

The term "fresh cheese" includes frischkäse, quark and cottage cheese.

Preferably the fermented milk product has a pH of about 4.8 or more, more preferably about 5.2 or more.

Said meat emulsion may comprise red meat such, for example, as beef, lamb or pork, or poultry such, for example, as turkey or chicken. Such meat has a pH of about 6.0 to 6.2 and an isoelectric point of about pH 5.0 to about 5.2. In order to provide a boiled sausage that is juicy and has a desirable texture, it has been found that it is essential to keep the pH of the mixture of meat emulsion and fermented milk product at about pH 5.5 or more. If the pH of the mixture falls below pH 5.5 towards the isoelectric point of the meat, the water-retaining capacity of the meat is reduced, with the result that the juiciness and texture of the final product is impaired.

In a particularly preferred embodiment of the invention, said fermented milk product comprises mild yogurt. Normal yogurt has a pH of about 3.6 to 5.1, typically about 4.6. It will be appreciated therefore that if such a yogurt is mixed with a meat emulsion, the pH of the resultant mixture may have a pH less than 5.5. A mild yogurt in accordance with the present invention may comprise yogurt that is prepared

in the traditional manner, but is used in the process of the invention before fermentation is fully completed. Thus, after inoculation of the milk mixture, the pH of the yogurt is monitored until it reaches the desired value. The mild yogurt is then made ready for use in the method of the present invention. In some embodiments, fermentation of the yogurt may be quenched by cooling the yogurt to a temperature in the range of -2 to 6°C, preferably 0 to 6°C. Preferably, the yogurt is cooled rapidly using liquid nitrogen or a plate-heat-exchanger.

In order to assist in controlling accurately the pH of the yogurt to be added to the meat emulsion, slow-working yogurt starter cultures are preferably used. Such slow working yogurt cultures may comprise Lactobacillus acidophilus, Bifidobacteria and Streptococcus thermophilus. Further, the yogurt is preferably stirred continuously before use to allow accurate pH control.

In accordance with the invention, buttermilk may be made from the residual milk that remains after conventional butter-churning, that is separation of the milk-fat (butter) from the remaining milk

substances. Said residual milk may be soured using
suitable, preferably slow-working, starter cultures
such as *lactococcus lactis* subsp. *cremoris*,
lactococcus lactis subsp. *lactis*, *Leuconostoc*
5 *mesenteroides* subsp. *cremoris* and/or *lactococcus*
lactis subsp. *diacetylactis* until a pH of about 4.8 or
more is reached. Alternatively said buttermilk may be
made by first souring whole milk to a desired pH with
suitable starter cultures, and then quenching
10 fermentation and churning to separate the buttermilk
from the milk-fat (butter).

Said soured creamed milk in accordance with the
invention may be made by souring whole milk with a
15 high fat content using suitable starter cultures such
as *lactococcus lactis* subsp. *cremoris*, *lactococcus*
lactis subsp. *lactis* and/or *leuconostoc mesenteroides*
subsp. *cremoris* to a desired pH of 4.8 or more.

20 Soured milk, including curd milk, may be made by
fermenting whole milk having a normal fat content
using starter cultures such, for example as
lactococcus lactis subsp. *cremoris*, *lactococcus lactis*
subsp. *lactis* and/or *leuconostoc mesenteroides* subsp.
25 *cremoris*.

- Said fresh cheese may be made in the conventional manner by fermenting whole milk using suitable cheese starter cultures such as *lactococcus lactis* subsp. *cremoris*, *lactococcus lactis* subsp. *lactis* and/or *leuconostoc mesenteroides* subsp. *cremoris* in the presence of a curdling enzyme such, for example, as rennet. Once the desired pH is reached, the fermentation may be quenched and the cheese allowed to set. Once the mass has set, the cheese may be crushed mechanically and the solid cheese component extracted from the remaining liquid whey. The consistency of the cheese may be adjusted as desired by centrifugation, straining and/or the addition of cream. For quark, starter cultures such as *lactobacillus acidophilus*, *lactococcus lactis* subsp. *cremoris*, *lactococcus lactis* subsp. *lactis* *leuconostoc mesenteroides* subsp. *cremoris* *bifidobacter* may be used.
- The remaining whey may also be used in accordance with the present invention when it has a pH of 4.8 or more.

Where the fermented milk product of the present invention comprises two or more different components, it is not necessary that each component has an

individual pH or 4.6 or more, only that the overall pH of the fermented milk product is 4.6 or more, preferably 4.8 or more, and in some embodiments 5.1 or more.

5

In some embodiments, said fermented milk product may comprise an edible, alkaline additive to neutralize the acidity of the product. Said alkaline additive may comprise, for example, carbonated soda and/or ammonium carbonate. Alkaline phosphates and/or citrates could also be used to stabilize the mixture.

10

In some embodiments, the fermented milk product may be used in dried or freeze-dried form.

15

Said mixture may comprise 60 to 90% by weight of said meat emulsion.

20

Said mixture may comprise 10 to 40% by weight of the fermented milk product, preferably 15 to 35% by weight. Typically, the mixture may comprise about 24 to 26% by weight of mild yogurt, e.g. 25% wt.

25

Said mixture may further comprise 0-10% by weight of various spices or other additives. In a particularly

preferred embodiment of the invention, said mixture may comprise up to 10% of a pre-biotic additive such as a non-digestible carbohydrate. An example of a pre-biotic carbohydrate is inulin. Said mixture may
5 comprise 2-7% wt inulin, which selectively promotes the activity of some health-promoting bacteria in the colon.

Said mixture of meat and fermented milk product may be
10 formed into sausages in any suitable manner to those skilled in the art, including moulding and extrusion. Preferably, the meat/milk mixture is extruded through a stuffing horn into a flexible sausage casing of the kind well known to those skilled in the art. However,
15 it is also envisaged that the boiled sausage in accordance with the present invention may be formed by moulding and then forming a skin in situ by treating the surface of the sausage with a suitable acid so as to cause coagulation of the surface layer of meat.

20

Said meat emulsion preferably comprises an emulsion of finely comminuted meat. Said meat emulsion may be formed by comminuting whole muscle, ground, minced or mechanically separated meat. The meat may be used
25 fresh or frozen. Said meat is preferably finely

comminuted in the presence of said yogurt to form an emulsion having a soft, homogeneous consistency. In some embodiments the emulsion may further comprise coarsely ground meat, which may be substantially
5 uniformly dispersed through the emulsion.

Preferably, the fermented milk product is added to the meat during comminution in small portions or continuously, for example, with the aid of pumping
10 equipment. It is preferable to ensure that the pH of the milk/meat mixture does not fall below about pH 5.5, even transiently, during mixing of the fermented milk with the meat. At the same time, it is preferable to ensure that the pH of the fermented milk
15 product is not increased too much by the meat, such that the characteristic aroma of the fermented milk is lost particularly where yogurt is used.

An advantage of the present invention is that by
20 adding a cooled, fermented milk product at a temperature of 0 to 6°C to the meat emulsion, the normal addition of cooled water to meat emulsions for sausage manufacture can be reduced or dispensed with altogether. Such cooled water is normally added to
25 maintain the temperature of the emulsion below about

12°C during comminution and subsequent extrusion, and also to bind with the meat emulsion to cause the product to swell. Of course, some fermented milk products contain a substantial proportion of water, and in accordance with the present invention, this water can be used to replace the additional water that is normally added during sausage manufacture.

Preferably the meat is chilled prior to admixture of the fermented milk product to a temperature in the range 0 to 8°C.

Finally, the sausage is cooked. Said sausage may be boiled. By "boiled" here is meant heating the sausage in any suitable, edible fluid, preferably water, at a temperature and for a time sufficient to cook the meat. In some embodiments the sausage may be steamed. Preferably the sausage is boiled at a temperature in the range 60 to 80°C, more preferably in the range of 70 to 75°C, eg 72°C. Alternatively, the sausage may be cooked in hot air and/or hot smoke. Preferably, the sausage is cooked at a sufficient temperature to kill the fermentation cultures, so as to prevent further fermentation of the milk in the finished product.

Thus, the present invention provides a novel cooked sausage containing meat and a fermented milk product and also a method for manufacturing this product. The cooked sausage of the invention is relatively high in protein, but contains reduced fat as compared with a conventional meat sausage. The fermented milk product, particularly yogurt, adds a distinctive flavour and aroma to the product. The pH of yogurt when added to the meat emulsion is sufficient low that the yogurt has the characteristic flavour and aroma of normal yogurt, but is not so low as to reduce the pH of the meat/yogurt mixture below about pH 5.5, so that the emulsion retains its water binding properties to ensure that a sausage is produced that is desirably juicy and has attractive organoleptic quality.

Following is a description by way of example only with reference to the accompanying drawings of methods occurred in the present invention into effect.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1A is a schematic, isometric view of a cooked sausage in accordance with the present invention.

Figure 1B is a schematic, isometric view of a slice of

a cooked sausage in accordance with the present invention.

Figure 2 shows a flow diagram for manufacturing a
5 boiled sausage in accordance with the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

With reference to Figures 1A and 1B, a boiled sausage, such as a frankfurter, in accordance with the
10 invention has a normal sausage shape and comprises an edible sausage material 10 that is stuffed into a conventional sausage casing 12. Said sausage material 10 comprises a finely comminuted meat emulsion 14 and a coarse component 16 that is substantially uniformly
15 dispersed through the emulsion 14. Said coarse component comprises coarsely ground pieces of meat and optional seasonings such, for example, as whole or coarsely ground peppercorns. In some embodiments, the coarse portion may be omitted.

20

Said finely comminuted meat emulsion 14 comprises a mixture of meat and a fermented milk product which are substantially homogeneously blended together to form an emulsion. The meat pieces of the coarse component
25 16 may also be tumbled with a fermented milk product.

EXAMPLES

Example 1

- 5 A specific example of a turkey putenjagdwurst with yogurt is made according to the following recipe:-

Finely Comminuted Meat Emulsion

	Turkey thigh meat	10.0%
10	Turkey white trim	20.5%
	Turkey dark trim	20.5%
	Chicken trim	14.2%
	Yogurt	25.1%
	Spices	9.7%
15		100%

Dry Ingredients for Meat Emulsion

	I. Curing salt	1.39%
	sodium citric	0.56%
20	II. Ground mustard seed	0.8%
	lactose	0.6%

III. Super Pök (ascorbate, sugar)	0.25%
Senator (spicemix Raps)	0.57%
Green Pepper (Raps)	0.16%
Glutalin (Raps) (flavourenhancer)	0.19%
HVP (hydrolysed vegetable protein)	0.19%
IV. Inulin (Frutafit)	4.9%
V. Liquid onion (Raps)	0.09%
liquid garlic (Raps)	0.03%
	9.73%

Coarse Component

Turkey thigh meat	66.2%
Yogurt	24.8%
Spices	9.0%
5	100%

The coarse component is ground through a 13mm plate.

Spices for Coarse Component

10	I. Curing salt	1.85%
	sodium citric	0.56%
	II. Inulin (Frutafit)	3.1%
	III. Super Pök (ascorbate, sugar)	0.12%
15	Green Pepper (Raps)	0.12%
	Glutalin (Raps)	0.26%
	IV. Spice-mix Schinkenwurstgewürz (Wolf)	0.70%
20	Senator (Raps)	0.44%

	V. Garlic, liquid (Raps)	0.22%
	fresh onion, liquid (Raps)	0.27%
	VI. Green pepper corns	1.35%
5		8.99%

The yogurt for addition to the meat emulsion and coarse component is manufactured in the traditional way using milk that is clarified and separated into cream and skimmed milk, and then standardised to achieve a desired fat content. The desired proportions of cream and skimmed milk are then blended together, and the mixture is pasteurised and then homogenised. The homogenised mixture is cooled to a temperature in the range of about 30 to about 50°C and then inoculated with a slow working yogurt starter culture comprising Streptococcus thermophilus, Lactobacillus acidophilus and Bifidobacteria. The mixture is then allowed to ferment for about four to six hours at 30 to 50°C, typically about 43°C, such that the mixture coagulates to form yogurt. As shown in Figure 2, the pH of the mixture is carefully monitored. When the pH of the yogurt reaches a target pH of about 5.1 to 5.2,

the yogurt is stirred to allow accurate determination of the pH. Such stirring also has the effect of an arresting fermentation. When a target pH of 4.8 or more is reached, the yogurt is subjected to shock
5 freezing to a temperature of about -1°C . At this temperature, further fermentation of the yogurt is prevented. For such shock freezing, liquid nitrogen or a plate-heat-exchanger may be used.

10 In view of the need to control accurately the pH of the yogurt used in the process of the invention, it is desirable that the yogurt is made at the same site as sausage manufacture takes place, but it is envisaged that alternatively yogurt supplied from a nearby dairy
15 may be used.

The chilled yogurt is then divided into two separate portions. A first portion is weighed for addition to the coarse component 16 of the sausage material 10.

20 At the weighing stage, the additional spices and additives are added to the yogurt. Said coarse component is then tumbled with the yogurt for about two hours and is then ground.

A second portion of the yogurt is added in small batches to minced meat having a temperature of about 0°C. Said minced meat is then finely comminuted with the yogurt to form an emulsion, and the yogurt assists
5 in maintaining the temperature of the meat emulsion below about 12°C. The additional spices and additives are added to the meat emulsion during comminution.

43% Wt of the coarse component is then mixed with 57%
10 wt of the comminuted meat emulsion, such that the coarse component is substantially uniformly dispersed throughout the finely comminuted meat emulsion. The mixture is then stuffed into sausage casings using a stuffing horn of the kind well know to those skilled
15 in the art. The resulting sausages are boiled at a temperature of about 72°C in the water and then showered, cooled, packed and labelled in the conventional manner.

20 The total amount of yogurt added to the sausage material is calculated such that the overall pH of the sausage material does not fall below about pH 5.5. In this way, the sausage material retains its ability to the bind water, so that a desirable juicy product is
25 produced. At the same time, the yogurt having a

target pH of about 4.8 or more has an acceptable yogurt flavour and aroma.

Example 2

- 5 A specific example of a pork meat putenjagdwurst with yogurt is prepared using the method described above in Example 1 as follows:-

Finely Comminuted Meat Emulsion

10	Lean pork trimmings	32.1%
	Pork shin meat	20.5%
	Pork neck fat	15.2%
	Yogurt	25.1%
	Spices	7.1%
15		100%

The emulsion is made in a bowl-chopper. Yogurt is added in small quantities.

Dry Ingredients for Emulsion

	I. Curing salt	1.39%
	sodium citric	0.56%
	II. Ground mustard seed	2.72%
5	lactose	0.9%
	III. Super Pök (ascorbate, sugar)	0.25%
	Senator (Spicemix Raps)	0.56%
	Green Pepper (Raps)	0.16%
10	glutalin (raps) (flavour enhancer)	0.19%
	HVP (hydrolysed vegetable protein)	0.19%
	IV. liquid onion (Raps)	0.09%
	liquid garlic (Raps)	0.03%
		7.04%
15	Coarse Meat Component	
	Pork shoulder 90VL	67.9%
	Yogurt	24.8%
	Spices	7.3%
		100%

—

Spices for Coarse Component

	I. Curing salt	1.85%
	sodium citric	0.56%
	II. lactose	0.5%
5	ground mustard seed	0.98%
	III. Super Pök (ascorbate, sugar)	0.12%
	Green Pepper (Raps)	0.12%
	Glutalin (Raps)	0.26%
10	IV. Spicemix Schinkenwurstgewürz (Wolf)	0.70%
	Senator (Raps)	0.44%
	V. Garlic, liquid (Raps)	0.22%
15	fresh onion, liquid (Raps)	0.27%
	VI. Green pepper corns	1.35%
		7.30%

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At the final mixing stage, 57% by weight of the finely comminuted pork meat emulsion is mixed with 43% weight of the coarse meat portion.

5 Example 3

A frankfurter with cottage cheese and frischkäse is made according to the following recipe:

Spices for Coarse Component

10	Port trimmings SOVL	40.0%
	Turkey white trim	10.0%
	Chicken trim	5.0%
	Water/ice	8.45%
	Cottage cheese, pH = 4.7	20.0%
15	Fresh cheese, pH = 4.8 - 4.9	10.0%
	Spices	6.55%
		100%

Spice mix for meat emulsion

20	Curing salt	1.5%
	Sodium citrate	0.8%

	Lactose	1.2%
	Ground mustard seed	1.2%
	Sodium ascorbate	0.05%
	Matador (Spice mix Raps)	1.1%
5	Hydrolysed vegetable protein	0.3%
	Liquid onion	0.2%
	Liquid garlic	0.2%
		6.55%

- 10 The cottage cheese and fresh cheese are made by conventional processes comprising fermenting milk using a cheese soured culture in the presence of a curdling enzyme such, for example, as rennet. As starter cultures may be used lactococcus lactis subsp.
- 15 cremoris, lactococcus lactis subsp. lactis and/or leuconostoc mesenteroides subsp. cremoris. As with the milk yogurt of Examples 1 and 2 above, the pH of the cheese is monitored as fermentation proceeds until the desired, final pH is reached, when fermentation is
- 20 arrested. Once the cheese has set, it is mechanically crushed, and the solid cheese component is separated from the whey residue. The consistency of the cheese

can be adjusted by centrifuging, straining and/or the addition of cream.

The cheese is then mixed with the other ingredients at
5 a temperature of about 0°C and finely comminuted in a
bowl chopper to form an emulsion. The emulsion is
then stuffed into shirred sausage casings using a
stuffing horn, and the resulting frankfurters are
boiled in water at a temperature of about 72°C,
10 showered, cooled, packed and labelled.

What is claimed is:

1. A cooked sausage comprising a mixture of a meat emulsion and a fermented milk product having a pH of 4.6 or more, wherein said fermented milk product is substantially homogeneously dispersed through the meat emulsion and said mixture has a pH of about 5.5 or more.
2. A cooked sausage as claimed in claim 1, wherein said fermented milk product has a pH of 4.8 or more.
3. A cooked sausage as claimed in claim 1, wherein said fermented milk product has a pH of 5.2 or more.
4. A cooked sausage as claimed in claim 1, wherein said fermented milk product is selected from one of more of mild yogurt, buttermilk, soured cream milk, soured milk, fresh cheese, fermented whey and kefir.
5. A cooked sausage as claimed in claim 1, wherein said mixture comprises 60 to 90% wt of said meat emulsion.
6. A cooked sausage as claimed in claim 1, wherein

said mixture comprises 10 to 40% by weight of the fermented milk product.

7. A cooked sausage as claimed in claim 1, wherein
5 said mixture further comprises up to 10% by weight of various spices or other additives.

8. A cooked sausage as claimed in claim 7 wherein
10 said mixture comprises up to 10% of a prebiotic additive.

9. A cooked sausage as claimed in claim 8, wherein said prebiotic additive is inulin.

10. A cooked sausage as claimed in claim 1, wherein
15 said meat emulsion comprises red meat or poultry.

11. A method of making a cooked sausage which
comprises forming a mixture of a meat emulsion and a
20 fermented milk product having a pH of 4.6 or more, in which mixture said fermented milk product is substantially homogeneously dispersed through the emulsion, forming the mixture into a sausage, and thereafter cooking the sausage; wherein the pH and
25 proportion of the fermented milk product in the

mixture is such that the pH of the mixture is 5.5 or more.

12. A method as claimed in claim 11 wherein said
5 fermented milk product has a pH of 4.8 or more.

13. A method as claimed in claim 11 wherein said
fermented milk product has a pH of 5.2 or more.

10 14. A method as claimed in claim 11, wherein said
fermented milk product is prepared by inoculating a
milk product with a starter culture, monitoring the pH
of the fermented milk product, and quenching
fermentation of the fermented milk product when the pH
15 reaches a desired value.

15. A method as claimed in claim 14, wherein
fermentation of the milk product is quenched by
cooling the fermented milk product to a temperature in
20 the range -2 to 6°C.

16. A method as claimed in claim 11, wherein said
starter culture comprises a slow working starter
culture.

17. A method as claimed in claim 11, wherein the mixture of meat and fermented milk product is formed into a sausage by extrusion through a stuffing horn into a flexible casing.

5

18. A method as claimed in claim 11, wherein said meat emulsion comprises an emulsion of finely comminuted meat and is formed by comminuting whole muscle, ground, minced or mechanically separated meat
10 in the presence of said fermented milk product.

19. A method as claimed in claim 18, wherein said fermented milk product is added to the meat at a temperature of 0 to 6°C.

15

20. A method as claimed in claim 18, wherein said meat has a temperature prior to comminution of 0 to 8°C.

20 21. A method as claimed in claim 11, wherein the sausage is cooked by heating in an edible fluid.

22. A method as claimed in claim 11, wherein the sausage is cooked by boiling in water at a temperature
25 in the range 60 to 80°C.

23. A method as claimed in claim 11, wherein said sausage is cooked in hot air and/or hot smoke.

24. A cooked sausage comprising a mixture of a meat emulsion and a mild yogurt, wherein said mild yogurt is substantially homogeneously dispersed through the meat emulsion and said mixture has a pH of about 5.5 or more.

25. A cooked sausage as claimed in claim 24, wherein said mild yogurt has a pH of 4.8 or more.

26. A cooked sausage as claimed in claim 24, wherein said mixture comprises 60 to 90% wt of said meat emulsion.

27. A cooked sausage as claimed in claim 24, wherein said mixture comprises 10 to 40% by weight of the mild yogurt.

28. A cooked sausage as claimed in claim 24, wherein said mixture further comprises up to 10% by weight of various spices or other additives.

29. A cooked sausage as claimed in claim 28, wherein

said mixture comprises up to 10% of a prebiotic additive.

30. A cooked sausage as claimed in claim 29, wherein
5 said prebiotic additive is inulin.

31. A cooked sausage as claimed in claim 24, wherein
said meat emulsion comprises red meat or poultry.

10 32. A method of making a cooked sausage which
comprises forming a mixture of a meat emulsion and
mild yogurt, in which mixture said yogurt is
substantially homogeneously dispersed through the
emulsion, forming the mixture into a sausage, and
15 thereafter cooking the sausage; wherein the pH and
proportion of the mild yogurt in the mixture is such
that the pH of the mixture is 5.5 or more.

33. A method as claimed in claim 32, wherein said
20 mild yogurt has a pH of 4.8 or more.

34. A method as claimed in claim 32, wherein said
mild yogurt is prepared by inoculating a milk mixture
with a yogurt starter culture, monitoring the pH of
25 the yogurt, and quenching fermentation of the yogurt

when the pH reaches a desired value.

35. A method as claimed in claim 34, wherein
fermentation of the yogurt is quenched by cooling the
5 yogurt to a temperature in the range -2 to 6°C.

36. A method as claimed in claim 34, wherein said
yogurt starter culture comprises a slow working yogurt
culture.

10 37. A method as claimed in claim 32, wherein the
mixture of meat and yogurt is formed into a sausage by
extrusion through a stuffing horn into a flexible
casing.

15 38. A method as claimed in claim 32, wherein said
meat emulsion comprises an emulsion of finely
comminuted meat and is formed by comminuting whole
muscle, ground, minced or mechanically separated meat
20 in the presence of said yogurt.

39. A method as claimed in claim 38, wherein said
yogurt is added to the meat at a temperature of 0 to
6°C.

25

40. A method as claimed in claim 38, wherein said meat has a temperature prior to comminution of 0 to 8°C.

5 41. A method as claimed in claim 32, wherein the sausage is cooked by heating in an edible fluid.

42. A method as claimed in claim 32, wherein the sausage is cooked by boiling in water at a temperature
10 in the range 60 to 80°C.

43. A method as claimed in claim 32, wherein said sausage is cooked in hot air and/or hot smoke.

5

Variable	Mean	SD	Min	Max
Age	35.5	10.5	20	65
Gender	Male	Female		
Marital status	Married	Single		
Education	High school	College		
Occupation	Manager	Worker		
Income	Low	High		
Health status	Good	Poor		
Smoking status	Smoker	Non-smoker		
Alcohol consumption	Regular	Occasional		
Exercise frequency	Regular	Occasional		
Stress level	Low	High		
Sleep quality	Good	Poor		
Dietary habits	Healthy	Unhealthy		
Family size	Small	Large		
Work-life balance	Good	Poor		
Life satisfaction	High	Low		
Overall well-being	Good	Poor		

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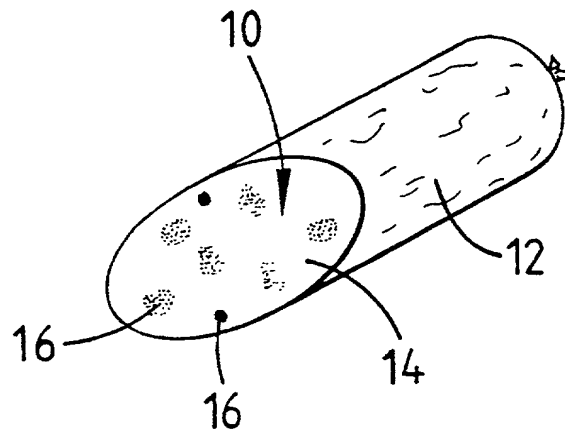


FIG. 1A

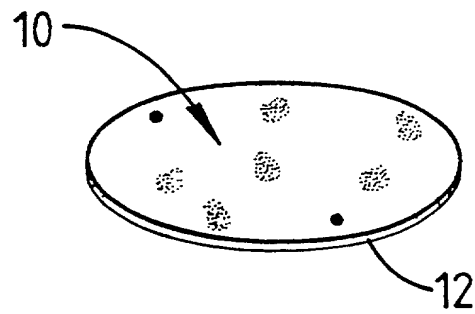


FIG. 1B

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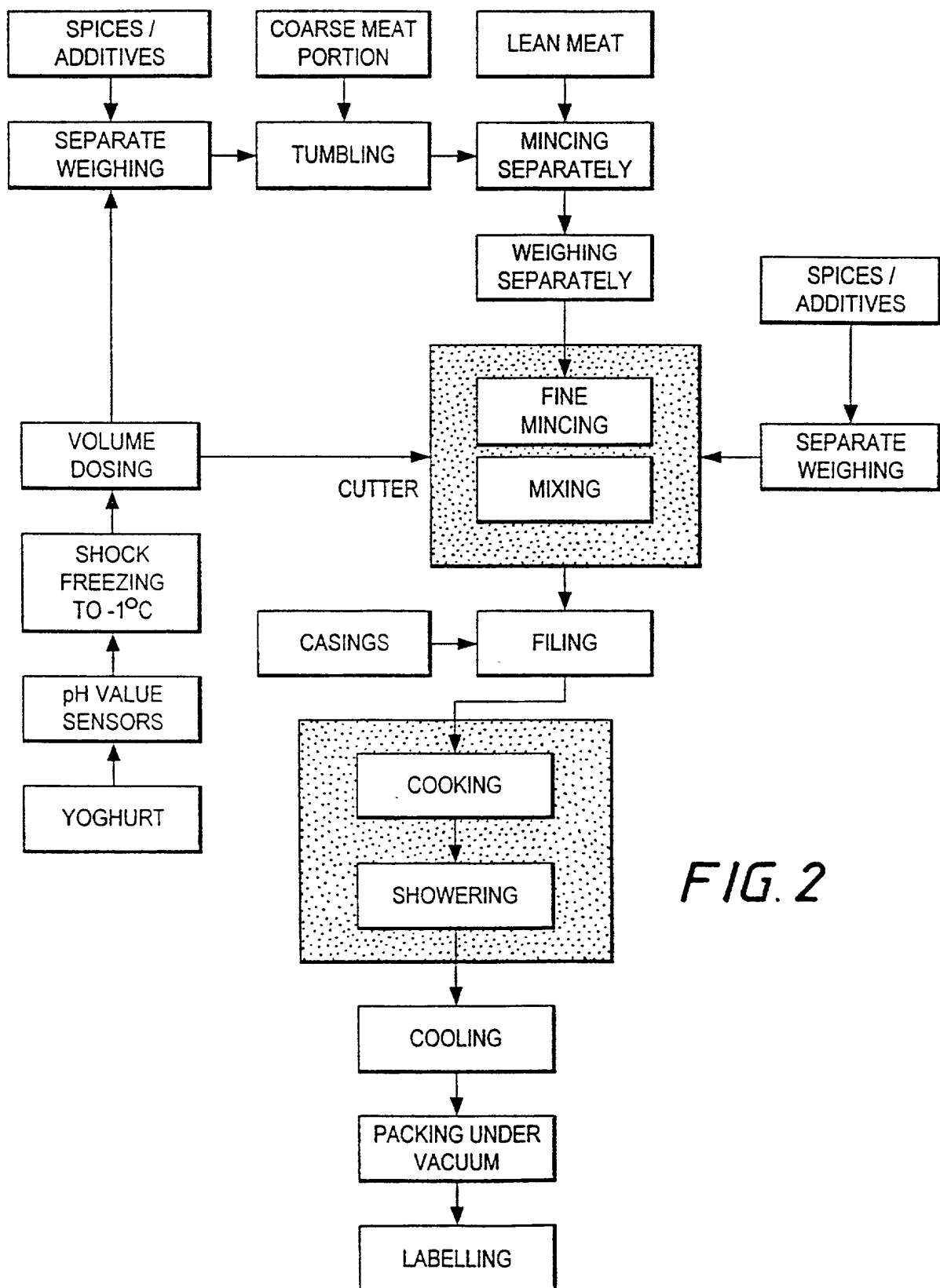


FIG. 2

Declaration and Power of Attorney For Patent Application

English Language Declaration

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

A NOVEL COOKED SAUSAGE AND A METHOD FOR MAKING THE SAME,
the specification of which is attached hereto unless the following box is checked:

☐ was filed on _____ as
United States Application Number or PCT International Application Number _____
and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56.

I hereby claim foreign priority benefits under 35 U.S.C. §119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s) Priority Not Claimed

19747197.8 Germany 24/10/1997

(Number) (Country) (Day/Month/Year Filed) ☐

19938434.7 Germany 13/08/1999

(Number) (Country) (Day/Month/Year Filed) ☐

I hereby claim the benefit under 35 U.S.C. § 119(e) of any United States provisional application(s) listed below.

(Application Number) (Filing Date)

(Application Number) (Filing Date)

I hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application:

PCT/GB98/0299907/10/1998Pending

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

(Application Number)

(Filing Date)

(Status - patented, pending, abandoned)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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Fifth inventor's signature _____ Date _____

Residence _____

Citizenship _____

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Full name of sixth joint inventor, if any (given name, family name) _____

Sixth inventor's signature _____ Date _____

Residence _____

Citizenship _____

Post Office Address _____

Full name of seventh joint inventor, if any (given name, family name) _____

Seventh inventor's signature _____ Date _____

Residence _____

Citizenship _____

Post Office Address _____